

## TWO NEW SPECIES AND ONE NEW COMBINATION OF THE CONIFER SAWFLY FAMILY DIPRIONIDAE (HYMENOPTERA: SYMPHYTA) FROM YUNNAN, CHINA

Xu Zhenghui

(Department of Forest Protection, Southwest Forestry College, Kunming 650224)

**Abstract** In this paper two new species of Diprionidae were described from Yunnan Province, China, *Gilpinia hebedentata*, sp. n. and *Macrodiiprion wui*, sp. n. Another species recorded in Yunnan, *Gilpinia disa* Smith, was transferred from *Gilpinia* Benson to *Microdiiprion* Enslin. *Macrodiiprion* Enslin is a newly recorded genus in China.

**Key words** Hymenoptera, Diprionidae, New species, New combination, Yunnan, China

Pine stand is an important part of the forest in Yunnan Province. Conifer sawflies are relatively abundant in the province, and they sometimes cause severe damage during outbreaks in pine stands. However the sawfly species were unknown before 1972. *Gilpinia disa* Smith (1972) was the first conifer sawfly recorded in Yunnan. Xiao *et al.* (1983–1985) recognized 14 species belonging to 5 genera in the province. From 1981 to 1989, I worked continuously with my supervisor, Professor Wu Yi, investigating the distribution, harmfulness, biology, and classifying the larvae, of the conifer sawflies in Yunnan Province. I discovered two undescribed species belonging respectively to *Gilpinia* Benson and *Macrodiiprion* Enslin. I also recognized that *Gilpinia disa* Smith should be transferred to *Microdiiprion* Enslin because of its simple tarsal claws.

The type specimens are deposited in the Insect Collection, Department of Forest Protection, Southwest Forestry College, Kunming, Yunnan, China.

### 1 *Gilpinia hebedentata*, sp. n. Figs. 1–2

Female—Length, 7.2–8.8 mm. Orange brown with following black: Antenna, interocellar area, and two longitudinal spots of the mesonotum. Some individuals with following light black to black: middle of anterior scutum, inner corner of lateral scutum, and scutellum. Following parts whitish: Apices of femora, tibiae of fore and mid legs, basal half of hind tibia, bases of tarsi, and cenchri. Wings hyaline, costa light yellow, remaining veins and stigma blackish brown.

Antenna serrate, 16–19 segmented, 4/5 width of head, rami of segments 5–13

本文 1995 年 11 月 28 日收到, 1996 年 7 月 18 日修回

about  $1/2$  width of respective segments. Malar space  $2 \times$  length of 2nd antennal segment. Postocellar area 2.5 times as broad as long. Ratio of distances between hindocellus and eye, between hindocelli, and between hindocellus and posterior margin of head =  $1.0 : 0.8 : 0.7$ . Anterior margin of mesoscutellum forming a blunt angle of about  $112^\circ$ . Width of cenchrus  $1.4 \times$  distance between cenchri and  $2.3 \times$  length of metascutellum. Anal cell of hindwing with petiole  $2 \times$  cell width. Head and thorax shining, with widely spaced punctures, distance between punctures  $2 \times$  or more than  $2 \times$  diameter of one puncture. Metascutellum with close large punctures. Sternum of mesothorax with large abundant punctures, distance between punctures about equal to diameter of one puncture. Abdomen with fine transverse microsculpture. Hairs on dorsum of head and thorax shorter than diameter of an ocellus. Hindtibial spurs simple. Sheath with large oval scopae, lateral margin of scopa slenderly protruding. Lancet (Fig.1) stout, wide at base, narrowing toward apex, ventral margin incurved, with 10–11 annuli. Upper  $3/4$  of annuli 1 and 2 straight and parallel. Teeth on annuli 1–3 blunt and rounded at apices. Serrulae on annuli 2–8 protruding, rectangular, each truncate at apex.

Male—Length, 5.1–7.0 mm. Black with following orange brown: Palpi, femora, and ventral face of abdomen. Tibiae and tarsi light yellow. Antenna pectinate, 19–21 segmented, rami on segments 3 to apex, ramus of 6th segment about equal to  $1/2$  length of antenna. Ratio of distances between hindocellus and eye, between hindocelli, and between hindocellus and posterior margin of head =  $1.0 : 0.9 : 0.5$ . Head and thorax with abundant punctures, distance between punctures about equal to diameter of one puncture. Scutellum and sterna of mesothorax largely and densely punctate, distance between punctures  $1/2$  diameter of one puncture. Penis valve (Fig.2) slender, curved. Valve body bifid at apex, lower lobe longer than upper one. Ossified area on valve body shorter and wider, with 9–11 microspines. Petiole expanded at base, with a lateral process. Other features as for female.

Types—Holotype ♀, Wenquan ( $24.9^\circ$  N,  $102.4^\circ$  E), 1850 m, Anning Co., Yunnan Prov., 1982–VII–28, No. 82–104, collected by Xu Zhenghui and Wang Jibin. Paratypes: 9 ♀♀, 10 ♂♂, with same data as holotype but Nos. 82–11, 12, 104, 105, 133, 134; Nos. 88–12, 129, 140, 141, 145, 322, 324; No. 89–22, 1982–V–10 to 1989–V–26, collected by Xu Zhenghui and Wang Jibin.

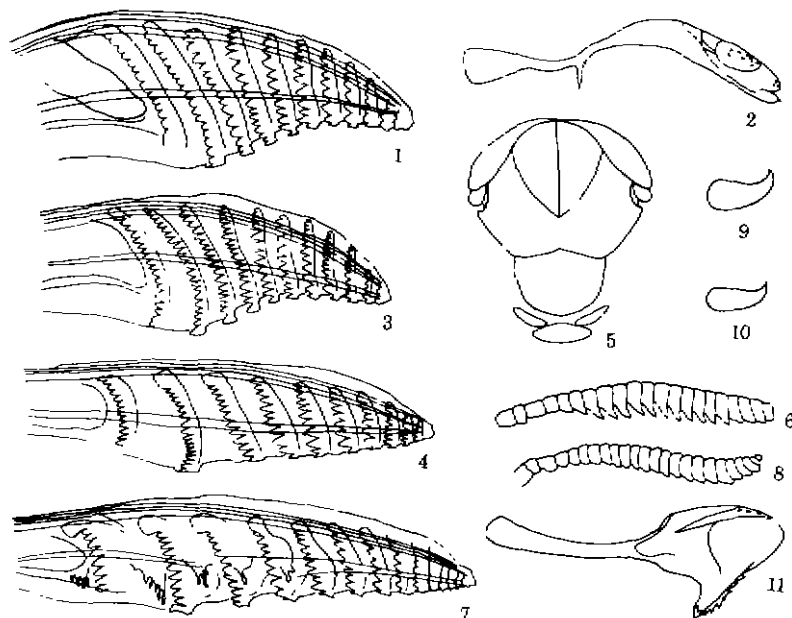
Host plant—*Pinus yunnanensis* Franch.

Distribution—Yunnan Province, China.

This new species is close to *Gilpinia jingxii* Xiao et Huang (Fig.3), but the female is orange brown, the dorsum of abdomen without black markings; the punctures on the head and thorax are weak and sparse; the upper  $3/4$  of annuli 1 and 2 of the lancet are straight, the teeth on annuli 1–3 are blunt and rounded at their apices; and the larvae live in small colonies, each containing 2–5 individuals. In *Gilpinia jingxii*, the abdomen of the female has black markings; the upper  $3/4$  of annuli 1 and 2 of the lancet are curved, the teeth on annuli 1–3 are sharp; and the larvae live in large colonies which contain 10–60 individuals.

Discussion—*Gilpinia hebedentata* and *G. jingxii* are close relatives, and they have sim-

ilar geographical distributions in Yunnan Province. However, *G. jingxii* is an important pest and sometimes causes large scale destruction in the pine forest.



Figs. 1-11 Diphriidae sawflies

1-2 *Gilpinia hebidentata*, 3 *G. jingxii*, 4-6 *Macrodipteron wui*, 7-8 *Macrodipteron nemoralis*, 9-11 *Microdipteron divus*. 1,3,4,7 Lancets, lateral; 2,11 Penis valves, lateral; 5 Thorax, dorsal; 6,8 Antennae, lateral; 9 Claw of female, lateral; 10 Claw of male, lateral (8 after Gussakovskii)

## 2 *Macrodipteron wui* sp. n. Figs. 4-6

Female—Length, 7.3–9.8 mm. Black with following white: Antennal segments 1–2, lateroposterior corners of pronotum, anterior 2/3 of mesoscutellum, first abdominal tergite except lateral portions, anterior margins of abdominal tergites 5–8 or 2–8. Sometimes middle of anterior 2/3 of mesoscutellum black. Mandibles reddish brown. Palpi and legs yellowish brown with following blackish: Bases of coxae, bases of femora, and apices of tibiae. Wings hyaline, covered with black microsetae, apical 1/3 of fore and hind wings lightly infuscated; costal and anal veins yellow, remaining veins and stigma blackish.

Antenna (Fig.6) serrate, 21–22 segmented,  $1.2\times$  width of head, incrassate toward apex, apical 2 segments narrowing. Segments 1–4 cylindrical, without rami, rami on segments 5 to apex. 3rd segment  $1.1\times$  length of 4th. Rami of segments 6–18 equal to  $2/5-4/5$  width of respective segments in lateral view. Malar space  $2\times$  length of 2nd antennal segment. Postocellar area  $2.5\times$  as broad as long. Ratio of distances between hindocellus and eye, between hindocelli, and between hindocellus and posterior margin of head = 1.0 : 0.9 : 0.6. Anterior margin of mesoscutellum (Fig.5) forming a very blunt an-

gle of about  $155^\circ$ . Width of cenchrus  $1.43 \times$  distance between cenchri and  $2.2 \times$  length of metascutellum. Anal cell of hindwing with petiole  $2.5 \times$  cell width. Head and thorax shining, densely punctate, distance between punctures about equal to diameter of one puncture. Punctures on mesoscutellum larger. Metascutellum closely punctate, distance between punctures less than diameter of one puncture and surface with fine microsculpture. Abdomen with fine dense microreticulation. Head and thorax densely covered with hairs, length of hairs equal to or slightly longer than diameter of an ocellus. Hindtibial spurs simple, basitarsus normal. Claw with a subapical tooth. Sheath with slender longitudinal scopae, close to each other. Lancet (Fig.4) slender and straight, wide at base, narrowing toward apex, ventral margin straight, with 10 annuli. Annular teeth acute. Annulus 1 arched, annuli 2 and 3 diverging ventrally, annuli 3 and 4 straight and parallel. Serrulae of annuli 2-9 low, each truncate at apex.

Male—Unknown.

Types—Holotype♀, Jiuxiang ( $24.9^\circ$  N,  $103.1^\circ$  E), 1900 m, Yiliang Co., Yunnan Prov., 1989-IV-21, No. 88-179, collected by Xu Zhenghui. Paratypes 3♀♀: 2♀♀, Haikou ( $24.8^\circ$  N,  $102.6^\circ$  E), 1950 m, Kunming, Yunnan Prov., 1982-VII-1, No. 82-252, collected by Li Hong; 1♀, Wenquan ( $24.9^\circ$  N,  $102.4^\circ$  E), 1850 m, Anning Co., Yunnan Prov., 1989-VII-5, No. 89-63, collected by Li Bin.

Host plant—*Pinus yunnanensis* Franch.

Distribution—Yunnan Province, China.

This new species is close to *Macrodiprion nemoralis* (Enslin) (Figs.7-8) in color and markings, but the veins of the wings are blackish brown; anterior margin of the clypeus is concave; the antenna has 21-22 segments, with the rami of segments 6-18 longer, equal to  $2/5-4/5$  width of their respective segments; the body is smaller; the lancet has 10-11 annuli, annulus 1 is arched, serrulae on annuli 2-5 are truncate at apex.

The new species is named after the forest entomologist, Professor Wu Yi (Southwest Forestry College, Kunming), for his contributions to the study of pine caterpillars, pine bark beetles, and conifer sawflies in Yunnan Province.

Discussion—According to the antennal character of the female, this species belongs to *Macrodiprion* Enslin, but its cenchri are larger. *Macrodiprion* is a newly recorded genus in China.

On the basis of the 2 known species of the genus, the diagnostic character of *Macrodiprion* can be expanded as follow: anterior margin of mesoscutellum forming a blunt or very blunt angle, much more than  $90^\circ$ ; cenchri small or large, the distance between cenchri broader or narrower than the width of one cenchrus; abdomen microsculptured and dull; anal cell of hind wing with the petiole much longer than the cell width; hindtibial spur simple, basitarsus normal; claw with a subapical tooth; malar space about  $2 \times$  length of 2nd antennal segment; antennae of female serrate, incrassate toward apex, but segments 1-4 simple and cylindrical, without rami. Lancet of female slender and straight, with straight ventral margin.

### 3 *Microdiprion disus* (Smith), comb. n. Figs. 9–11

*Gilpinia disa* Smith, 1972 *Proc. Ent. Soc. Wash.* 74(1): 22.

This species was described by Smith (1972) based on 2 females collected in Kunming, Yunnan Province. However, the tips of antennae and legs were missing in both specimens, so Smith could not observe their claws. From 1981 to 1989, we collected a long series of specimens of *Gilpinia disa* including females and males. We noticed that the claw (Figs. 9–10) of *G. disa* is simple, without a subapical tooth. According to this character, *disa* should be transferred from *Gilpinia* Benson to *Microdiprion* Enslin. Smith has concurred with this transfer (personal correspondence, 1995).

Female—Description as in Smith (1972). Length 5.5–7.7 mm. Antenna serrate, 17–21 segmented, rami on segments 3 to apex, rami of segments 5–18 about  $2 \times$  length of respective segments. Anal cell of hindwing with petiole about equal to cell width. Hindtibial spurs simple, basitarsus normal. Claw simple, without a subapical tooth.

Male—Length, 5.0–6.2 mm, slender. Black, femora yellowish brown, tibiae and tarsi yellow. Forewing hyaline, posterior margin and stigma yellowish brown. Hindwing with apical  $1/2$  deeply infuscated. Antenna pectinate, 18–21 segmented. Ratio of distances between hindocellus and eye, between hindocelli, and between hindocellus and posterior margin of head =  $1.0 : 0.8 : 0.5$ . Anterior margin of mesoscutellum straight or nearly straight. Width of cenchrus  $2 \times$  distance between cenchri and  $4 \times$  length of metascutellum. Anal cell of hindwing with petiole  $1.5 \times$  cell width. Head and thorax with dense deep punctures, distance between punctures about equal to diameter of one puncture, punctures on head moderately large, punctures on thorax small, punctures on mesoscutellum coarse and large. Abdomen smooth and shining, with very sparse punctures. Penis valve (Fig. 11) subtriangular, with large tooth-like ventral lobe, anteroventral margin with row of small teeth. Petiole long and slender.

Host plant—*Keteleeria evelyniana* Mast.

Distribution—Yunnan Province, China.

Discussion—Beside *disus*, one other species of *Microdiprion* is known in Yunnan, *M. keteleeriaefolius* Xiao et Huang. It also feeds on *Keteleeria evelyniana* Mast. The *Microdiprion* species of China seem to prefer *Keteleeria* plants as their hosts. In contrast, species of *Diprion*, *Macrodiprion*, *Nesodiprion*, *Neodiprion*, and *Gilpinia* prefer *Pinus* species as their hosts.

**Acknowledgements** I thank Dr. David R. Smith (U. S. Department of Agriculture, Washington, D.C.) for his kindness of copying literature, sending the female lancet slide of *Macrodiprion nemoralis* (Enslin) for comparison, and reading the manuscript. I also thank Professor Wu Yi (Southwest Forestry College, Kunming) for his uninterrupted guidance in the past 15 years, collecting specimens and literature, and Mr. Wang Jibin, Li Hong, and Li Bin (former students of Southwest Forestry College, Kunming) for collecting the type specimens.

20885(77)

## References

- Benson R B, 1939. On the genera of the Diprionidae (Hymenoptera, Symphyta) *Bull. Ent. Res.*, **30** : 339-342.
- Benson R B, 1945. Further note on the classification of the Diprionidae (Hymenoptera, Symphyta). *Bull. Ent. Res.*, **36** : 163-164.
- Gussakovskii V V, 1947. Faune de L'URSS, Insectes Hyménoptères, Vol. 2, No 2 Chalastogastra (Pt.2), (In Russian, summary in English). 1-234.
- Smith D R, 1972. A new *Gilpinia* from China. *Proc. Ent. Soc. Wash.* **74**(1) : 21-23.
- Smith D R, 1974. Conifer sawflies, Diprionidae: Key to North American genera, checklist of world species, and new species from Mexico (Hymenoptera) *Proc. Ent. Soc. Wash.*, **76**(4) : 409-418.
- Smith D R, 1983. Two new species of *Gilpinia* (Hymenoptera: Diprionidae) feeding on *Pinus kesiya* in Thailand. *Proc. Ent. Soc. Wash.*, **85**(2) : 212-216.
- Takeuchi K, 1940. A systematic study on the suborder Symphyta (Hymenoptera) of the Japanese Empire (III). Family Diprionidae. *Tenthredo*, **3**(2) : 187-199.
- Xiao G-r, Zhou S-z, Huang X-y, 1984. Seven new species of conifer sawflies from China (Hymenoptera: Diprionidae). *Entomotaxonomia*, **6**(2-3) : 141-150.
- Xiao G-r, Huang X-y, and Zhou S-z, 1984-1985. The Chinese sawflies of the family Diprionidae (Hymenoptera: Symphyta). *Scientia Silvae Sinicae*, **20**(4) : 366-371, **21**(1) : 30-43.
- Xiao G-r, 1992. Two new sawflies of the genus *Gilpinia* in China (Hymenoptera, Symphyta, Diprionidae). *Forest Research*, **5**(2) : 193-195.

171-176

## 中国云南松叶蜂科二新种一新组合记述

(膜翅目: 广腰亚目)

徐正会

(西南林学院森林保护系 昆明 650224)

Q969.542.1

A 摘要 在中国云南省发现松叶蜂科 Diprionidae 2 新种, 即钝齿吉松叶蜂 *Gilpinia hebedentata* 新种和吴氏大松叶蜂 *Macrodiiprion wui* 新种。另一个记载于云南的种 *Gilpinia disa* Smith 从吉松叶蜂属 *Gilpinia* Benson 移入小松叶蜂属 *Microdiiprion* Enslin, 称迪萨小松叶蜂 *Microdiiprion disus* (Smith) 新组合。大松叶蜂属 *Macrodiiprion* Enslin 为中国新记录属。

关键词 膜翅目, 松叶蜂科, 新种, 新组合, 中国, 云南